AMENDMENT TO THE CLAIMS:

This listing of claims will replace all prior versions of claims in the application:

LISTING OF CLAIMS:

1. (Previously presented) A method for forming a magnetic head having an improved PtMn layer, comprising:
forming a PtMn layer using ion beam deposition;
forming an antiparallel (AP) pinned layer structure above the PtMn layer;
forming a free layer above the AP pinned layer structure;
forming a spacer layer above the free layer; and
forming a bias layer above the spacer layer
wherein at least one of the AP pinned layer structure and the free layer are formed by a process other than ion beam deposition.

2. (ORIGINAL) A method as recited in claim 1, wherein the AP pinned layer structure includes at least two pinned layers having magnetic moments that are antiparallel to each other, the pinned layers being separated by an AP coupling layer.

3. (PREVIOUSLY PRESENTED) A method as recited in claim 1, wherein a signal (dR) of the head is at least 2% greater than a signal (dR) of a substantially similar head having a PtMn layer formed by plasma vapor deposition.

4. (PREVIOUSLY PRESENTED) A method as recited in claim 1, wherein a signal (dR) of the head is at least 4% greater than a signal (dR) of a substantially similar head having a PtMn layer formed by plasma vapor deposition.

5. (PREVIOUSLY PRESENTED) A method as recited in claim 1, wherein an easy axis coercivity (Hce) of the free layer is at least 5% less than an easy axis coercivity (Hce) of a free layer of a substantially similar head having a PtMn layer formed by plasma vapor deposition.

6. (PREVIOUSLY PRESENTED) A method as recited in claim 1, wherein an easy axis coercivity (Hce) of the free layer is at least 10% less than an easy axis coercivity (Hce) of a free layer of a substantially similar head having a PtMn layer formed by plasma vapor deposition.

7. (PREVIOUSLY PRESENTED) A method as recited in claim 1, wherein an easy axis coercivity (Hce) of the free layer is at least 15% less than an easy axis coercivity (Hce) of a free layer of a substantially similar head having a PtMn layer formed by plasma vapor deposition.

8. (PREVIOUSLY PRESENTED) A method as recited in claim 1, wherein a hard axis coercivity (Hch) of the free layer is at least 10% less than a hard axis coercivity (Hch) of a free layer of a substantially similar head having a PtMn layer formed by plasma vapor deposition.

9. (PREVIOUSLY PRESENTED) A method as recited in claim 1, wherein a hard axis coercivity (Hch) of the free layer is at least 15% less than a hard axis coercivity (Hch) of a free layer of a substantially similar head having a PtMn layer formed by plasma vapor deposition.

10. (PREVIOUSLY PRESENTED) A method as recited in claim 1, wherein a hard axis coercivity (Hch) of the free layer is at least 20% less than a hard axis coercivity (Hch) of a free layer of a substantially similar head having a PtMn layer formed by plasma vapor deposition.

11. (ORIGINAL) A method as recited in claim 1, wherein each of the layers above the PtMn layer is formed by plasma vapor deposition.

12. (Previously presented) A method as recited in claim 1, wherein the free layer is formed by plasma vapor deposition.

13. (WITHDRAWN) A head formed by the process recited in claim 1.

14. (WITHDRAWN) A head as recited in claim 13, wherein the head forms part of a GMR head.

15. (WITHDRAWN) A head as recited in claim 13, wherein the head forms part of a CIP GMR sensor.

16. (Currently amended) A method for forming a magnetic head having an improved PtMn layer, comprising:
forming seed layers;
forming a PtMn layer above the seed layers using ion beam deposition;
forming an antiparallel (AP) pinned layer structure above the PtMn layer;
forming a free layer above the AP pinned layer structure;
forming a spacer layer above the free layer; and
forming a bias layer above the spacer layer;
wherein at least one of the free layer and antiparallel (AP) pinned layer structure are formed by a method other than ion beam deposition.

17. (WITHDRAWN) A head formed by the process recited in claim 16.

18. (WITHDRAWN) A magnetic storage system, comprising:

magnetic media;

at least one head for reading from and writing to the magnetic media, each head having:

a sensor formed at least in part by the process recited in claim 1;

a write element coupled to the sensor;

a slider for supporting the head; and

a control unit coupled to the head for controlling operation of the head.

19. (New) A method as in claim 1 wherein the ion beam deposition comprises an ion assisted ion beam deposition performed using first and second ion sources, the first ion source being directed at a target and the second ion source being an ion assist source (IAD) directed at a wafer on which material from the target is to be deposited.